模拟扭曲排列模式液晶和 IPS 模式液晶的指向矢分布

摘 要

液晶的主要应用领域和研究方向是液晶的光学特性方面，因此液晶的光学特性研究是使这一学科向前发展的基础。

本文针对液晶的概念进行了简要的叙述，分别对不同种类的液晶进行了详细的介绍，包括它们各自的结构，光学特性和应用。

简要的介绍了指向矢的概念并对牛顿法，张弛法和差分迭代法这三种模拟方法进行了对比分析。模拟了扭曲排列模式的液晶和 IPS 模式液晶的指向矢分布并指出了它们的特点和区别。

设计了一种光开关，使其在不加电压时有光通过，随着电压的升高光透过率越来越小，并提出了一个检测其光电特性的方法。

关键词：液晶；指向矢模拟；光开关

Abstract

The main application field and research direction of liquid crystal are liquid crystal display and liquid crystal optics. Therefore, the study of optical properties of liquid crystals is the basis for the development of this subject.

In this paper, the concept of liquid crystals is briefly described, and different types of liquid crystals are introduced in detail, including their structures, optical properties and applications.

Point to the concept of vector are briefly introduced, and the Newton's method, the relaxation method and differential iterative method has carried on the comparative analysis of three kinds of simulation method. The distribution of the direction vectors of the liquid crystals in the distorted arrangement mode and the liquid crystals in the IPS mode are simulated and their characteristics and differences are pointed out.

An optical switch is designed to make the light pass through when the voltage is not applied. With the rise of voltage, the transmittance of specular light becomes smaller and smaller. A method of detecting its photoelectric characteristics is proposed.

Key Word：liquid crystal；vector pointing simulation；optical switch

目 录